

Note on the External Nares of the Cormorant.

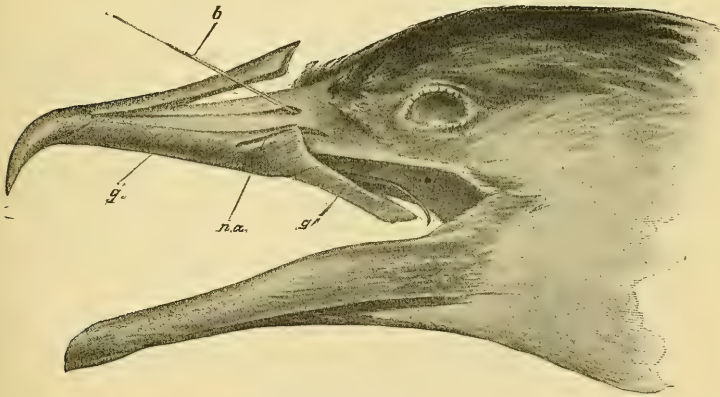
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THE following short note, with two figures, is intended as a supplement to a similar contribution to the pages of this Journal made by Prof. J. C. Ewart*.

In that communication Prof. Ewart described the external nostril as a "mere slit situated at the end of a shallow superficial groove, which runs backwards along the beak parallel with its lower edge, and lying between its lower and middle third." And concerning it he wrote: "When a bristle is introduced into the slit, it never succeeds in forcing a passage into the nasal cavity. If the skin which forms the outer boundary of the slit is carefully

Fig. 1.



Left side view of the head of a Cormorant (*Phalacrocorax carbo*) in which the rhamphotheca has been displaced to show the horny plug which has been withdrawn from the aperture of the external nares.—*b*, bristle; *g*, gnathotheca; *g'*, posterior maxillary portion of the gnathotheca; *n.a.*, external narial aperture.

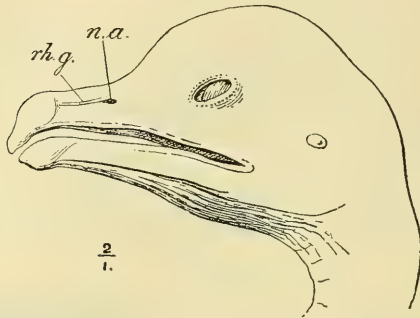
reflexed, a groove is exposed which runs from the external slit-like nostril to a narrow canal lined apparently by modified mucous membrane it is possible to pass through this canal,

* Vol. xv. 1881, p. 455.

without forming a false passage, a bristle about the size of an ordinary horse-hair”

The external nostril in every species of adult Cormorant which I have examined appears to lie without and below the rhinothecal groove (fig. 1, *n.a.*), and not at its end as just described. As seen in the figure, it is represented by a shallow groove

Fig. 2.



Left side view of the head of an embryo Cormorant to show the relatively large narial aperture lying within the rhinothecal groove.—*rh.g.*, rhinothecal groove.

pointing downwards and forwards to the tomium. Its upper end joins the rhinothecal groove at its base, where it passes into the naked skin of the lores.

I have not been able to find any trace of this narial groove, or aperture, in the Gannets.

I failed entirely to pass even the finest bristle up this groove into the nasal cavity, though I tried in many species of Cormorant—one a fresh, and the rest spirit-specimens.

My next step in this investigation was to force the rhamphotheca from the jaw. The rhinotheca was first raised and then the gnathotheca. This last brought away with it a short rod-like plug (fig. 1, p. 207)—apparently an inward and backward continuation of that part of the rhamphotheca surrounding the external narial aperture, indicated by the groove just described (fig. 1, *n.a.*). Thus, instead of surrounding the aperture and giving place in this region to mucous membrane, the sheath seems to have grown inwards so as to form a horny tubular

lining. Microscopical examination—made in the first instance by my friend Mr. H. M. Bernard, and afterwards confirmed by myself—showed that the lumen of the “plug” was completely blocked up by delamination of fragments of the horny layers from its inner surface. A bristle passed down the narial aperture, now thrown open by the removal of the plug, made its exit as usual at the posterior nares.

The nasal cavity is a small chamber devoid of any trace of turbinal folds, and more or less imperfectly divided into anterior and posterior moities by a vertical transverse partition depending from the roof into the chamber, the ventral border of the partition being free.

In the embryo (fig. 2) the narial aperture lies within the rhinothecal groove, much as described by Ewart in the adult, and is still open. It is interesting to note that the oblique groove for this aperture in the adult is not yet indicated, neither is the segmented portion of the posterior end of the gnathotheca, so marked in the Gannets though comparatively slightly developed in the Cormorants (fig. 1, *g'*).

Mr. F. A. Lucas in ‘The Auk’ (vol. xiv. p. 87) has an interesting note on the external nares of the embryo and nestling Cormorant. He finds the nostrils still open in the oldest of the nestlings in his collection; the age of these he estimates at 28 days. He considers “that the external nostrils close about the time the young Cormorants take to the water and begin to feed themselves.”
